

**Oracle® VM**

**Paravirtual Drivers Release 3.2.3 Installation Guide for**

**Microsoft Windows**

**ORACLE®**

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### Abstract

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# Preface

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The preface contains information on how to use the Oracle VM Paravirtual Drivers Installation Guide for Microsoft Windows.

## 1 Audience

The Oracle VM Paravirtual Drivers Installation Guide for Microsoft Windows is intended for users and administrators of Oracle VM guests running the Microsoft Windows™ operating system. It includes a brief introduction of the Oracle VM Paravirtual Drivers for Microsoft Windows, how to install them, and describes potential issues and the corresponding workarounds you may encounter while using the drivers.

Oracle recommends that you read this document before installing and using the Oracle VM Paravirtual Drivers for Microsoft Windows.

## 2 Related Documents

For more information, see the following documents in the Oracle VM documentation set:

- [Oracle VM Release Notes](#)
- [Oracle VM Installation and Upgrade Guide](#)
- [Oracle VM Concepts Guide](#)
- [Oracle VM Manager Getting Started Guide](#)
- [Oracle VM Manager User's Guide](#)
- [Oracle VM Manager Command Line Interface User's Guide](#)
- [Oracle VM Administrator's Guide](#)
- [Oracle VM Windows Paravirtual Drivers Installation Guide](#)
- [Oracle VM Web Services API Developer's Guide](#)
- [Oracle VM Security Guide](#)
- [Oracle VM Licensing Information User Manual](#)

You can also get the latest information on Oracle VM by going to the Oracle VM Web site:

<http://www.oracle.com/us/technologies/virtualization/oraclevm>

## 3 Command Syntax

Oracle Linux command syntax appears in `monospace` font. The dollar character (\$), number sign (#), or percent character (%) are Oracle Linux command prompts. Do not enter them as part of the command. The following command syntax conventions are used in this guide:

Convention	Description
backslash \	A backslash is the Oracle Linux command continuation character. It is used in command examples that are too long to fit on a single line. Enter the command as displayed (with a backslash) or enter it on a single line without a backslash:  <code>dd if=/dev/rdsk/c0t1d0s6 of=/dev/rst0 bs=10b \ count=10000</code>
braces { }	Braces indicate required items:  <code>.DEFINE {macrol}</code>
brackets [ ]	Brackets indicate optional items:  <code>cvt crt <i>termname</i> [<i>outfile</i>]</code>
ellipses ...	Ellipses indicate an arbitrary number of similar items:  <code>CHKVAL <i>fieldname</i> <i>value1</i> <i>value2</i> ... <i>valueN</i></code>
<i>italics</i>	Italic type indicates a variable. Substitute a value for the variable:  <code><i>library_name</i></code>
vertical line	A vertical line indicates a choice within braces or brackets:  <code>FILE <i>filesize</i> [K M]</code>
forward slash /	A forward slash is used as an escape character in the Oracle VM Manager Command Line Interface to escape the special characters " , ' , ? , \ , / , < , >. Special characters need only be escaped when within single or double quotes:  <code>create Tag name=MyTag description="HR/ 's VMs"</code>

## 4 Conventions

The following text conventions are used in this document:

Convention	Meaning
<b>boldface</b>	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
<code>monospace</code>	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

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# Chapter 1 Introduction to the Oracle VM Paravirtual Drivers for Microsoft Windows

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## 1.1 Overview of the Oracle VM Paravirtual Drivers for Microsoft Windows

The Oracle VM Paravirtual Drivers for Microsoft Windows provide a performance boost for network and block (disk) devices on Microsoft Windows™ *guests* running in a virtual environment on Oracle VM. If you do not use the Oracle VM Paravirtual Drivers for Microsoft Windows, you may experience issues such as:

- Shutting down the guest does not shut down gracefully. Instead, it is the equivalent of turning the power off. In this case, if you are using the virtual machine console, the console would immediately turn to black instead of showing the shut down process.
- Restarting the virtual machine may display messages that the virtual machine was not properly shut down.
- Restarting the virtual machine requires disk checks and verification.

Installing the Oracle VM Paravirtual Drivers for Microsoft Windows in your Windows guest fixes all these issues. It is a requirement for Oracle Support that you install these drivers to obtain support on any issues you may have running your Windows virtual machines.

Download the Oracle VM Paravirtual Drivers for Microsoft Windows from:

[https://updates.oracle.com/Orion/PatchDetails/process\\_form?patch\\_num=16863114](https://updates.oracle.com/Orion/PatchDetails/process_form?patch_num=16863114)

The Oracle VM Paravirtual Drivers for Microsoft Windows are included with the Oracle VM media pack. The Oracle VM Paravirtual Drivers for Microsoft Windows installer installs *paravirtualized* drivers for block (disk) and network devices.

This document gives information on using the Oracle VM Paravirtual Drivers for Microsoft Windows included with the Oracle VM media pack. At the time of writing, the Oracle VM Paravirtual Drivers for Microsoft Windows release number is Release 3.2.3.

## 1.2 Oracle VM Paravirtual Drivers for Microsoft Windows Supported Releases

The Oracle VM Paravirtual Drivers for Microsoft Windows are supported with the Oracle VM releases listed in the following table.

**Table 1.1 Oracle VM Paravirtual Drivers for Microsoft Windows Supported Releases**

Oracle VM Release	Oracle VM Paravirtual Drivers for Microsoft Windows Release 3.0.1	Oracle VM Paravirtual Drivers for Microsoft Windows Release 3.2.2	Oracle VM Paravirtual Drivers for Microsoft Windows Release 3.2.3
Oracle VM 3.0	Yes	No	No
Oracle VM 3.1	Yes	No	No
Oracle VM 3.2	Yes	Yes	Yes
Oracle VM 3.3	No	Yes	Yes

## 1.3 Supported Guest Operating Systems

The following Microsoft Windows operating systems are supported. The supported operating systems must have the Oracle VM Paravirtual Drivers for Microsoft Windows installed in the guest operating systems.

**Table 1.2 Microsoft Windows Supported Guest Operating Systems**

Guest Operating System with Oracle VM Paravirtual Drivers for Microsoft Windows Installed	64-bit	32-bit
Microsoft Windows Server 2012 R2	Yes	N/A
Microsoft Windows Server 2012	Yes	N/A
Microsoft Windows Server 2008 R2 SP1	Yes	N/A
Microsoft Windows Server 2008 SP2	Yes	Yes
Microsoft Windows Server 2003 R2 SP2	Yes	Yes
Microsoft Windows 8.1	Yes	Yes
Microsoft Windows 8	Yes	Yes
Microsoft Windows 7 SP1	Yes	Yes
Microsoft Windows Vista SP2	Yes	Yes

## 1.4 Microsoft Windows Compatibility Signing

Oracle VM Paravirtual Drivers for Microsoft Windows Release 3.2.3 have been signed by Microsoft for the Windows 2012 software logo program as compatible on 64-bit versions of Windows Server 2012, Windows Server 2008, Windows 8.1, and Windows 7. See the [Windows Server Catalog](#) for more information.

Oracle VM Paravirtual Drivers for Microsoft Windows Release 3.2.3 are not signed for Microsoft Windows Server 2003 or for any 32-bit Windows operating system. A security alert occurs during installation on a Windows operating system for which Oracle VM Paravirtual Drivers for Microsoft Windows are not signed. See [Section 4.1, “Security Alert for Unsigned Drivers”](#).

## 1.5 Configuration Limits

This section contains the configuration maximums for the Oracle VM Paravirtual Drivers for Microsoft Windows. The limits presented in the following table represents tested and recommended limits.

**Table 1.3 Oracle VM Paravirtual Drivers for Microsoft Windows configuration maximums**

Item	Maximum
Virtual CPUs	32

Item	Maximum
Virtual RAM on 32-bit guests	64 GB
Virtual RAM on 64-bit guests	256 GB
Virtual disks	40  The number of virtual disks includes the number of virtual NICs. See <a href="#">Note</a> .
Virtual NICs	8  The number of virtual NICs are included in the number of virtual disks. See <a href="#">Note</a> .

**Note**

The number of virtual disks includes the number of virtual NICs. If there are eight virtual NICs, only 32 virtual disks are supported. Virtual disks are assigned a higher priority than virtual NICs. If a virtual machine is configured with eight virtual NICs, and 35 virtual disks, then 35 disks are created, and five VNICs.



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## Chapter 2 What's New?

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This chapter lists the new features introduced in each 3.x release of the Oracle VM Paravirtual Drivers for Microsoft Windows. For features introduced in the previous 2.0 release, see the *Oracle VM Windows Paravirtual (PV) Drivers 2.0: New Features* white paper at:

<http://www.oracle.com/us/technologies/virtualization/oraclevm/winpv20-newfeatures-wp-080929.pdf>

## 2.1 What's New in Release 3.2.3 of the Oracle VM Paravirtual Drivers for Microsoft Windows?

Release 3.2.3 provides a cumulative update of fixes, as follows:

- Fixes an issue where the default policy on virtual disks was set to write-caching, which resulted in a loss of data integrity. **Bug 19452465**
- Fixes an issue where the network interface of the Windows guest was lost when an Oracle VM Server was upgraded to Release 3.3 in Cisco UCS server. **Bug 19449368**
- Fixes an issue where the current network interface settings are not applied during an installation of Oracle VM Paravirtual Drivers for Microsoft Windows. **Bug 18865098**
- Fixes an issue where it is not possible to format disks on a Windows virtual machine in some circumstances. **Bug 18707840**
- Fixes an issue where a system crash, or fatal system error, occurs when upgrading from a previous release of Oracle VM Paravirtual Drivers for Microsoft Windows. **Bug 18702781**
- Fixes performance degradation issues if more than 16 virtual CPUs (vCPU) are configured on some Windows guests. **Bug 18593684** and **Bug 18558015**
- Fixes an issue where a virtual disk provisioning failure occurs if the virtual disk is greater than 1TB. **Bug 18553901**
- Fixes an issue where a system crash, or fatal system error, occurs on a 32-bit Windows operating system. **Bug 18361346**

## 2.2 What's New in Release 3.2.2 of the Oracle VM Paravirtual Drivers for Microsoft Windows?

The new features and enhancements in Release 3.2.2 include additional support for the following new guest operating systems:

- Microsoft Windows Server 2012 R2
- Microsoft Windows Server 2012

- Microsoft Windows 8.1
- Microsoft Windows 8

The following maximum limit configurations have been tested with the Oracle VM Paravirtual Drivers for Microsoft Windows:

- Maximum number of virtual CPUs: 32
- Maximum RAM per 32-bit guest: 64 GB
- Maximum RAM per 64-bit guest: 256 GB

## **2.3 What's New in Release 3.0.1 of the Oracle VM Paravirtual Drivers for Microsoft Windows?**

Release 3.0.1 includes support for the Storport miniport driver, which delivers improved performance compared to the SCSI port driver.

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# Chapter 3 Installing the Oracle VM Paravirtual Drivers for Microsoft Windows

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You can install the Oracle VM Paravirtual Drivers for Microsoft Windows with an installation wizard or perform a silent with a response file. If you are installing a single instance of the Oracle VM Paravirtual Drivers for Microsoft Windows, you should use the installation wizard. If you are installing multiple instances of the Oracle VM Paravirtual Drivers for Microsoft Windows, you should use the response file.

### 3.1 Configuring Policies for Device Installation

You must configure Microsoft Windows policies to allow the installation of the Oracle VM Paravirtual Drivers for Microsoft Windows, if these policies are not already configured. This task prevents the following error during installation: `The installation of this device is forbidden by system policy. Contact your system administrator.`

To configure policies for installation, do the following:

1. Open the Microsoft Windows virtual machine on which you want to install the Oracle VM Paravirtual Drivers for Microsoft Windows.
2. From the **Start menu**, select **Run**.
3. Enter `gpedit.msc` and then click **OK**.

The **Local Group Policy Editor** displays.

4. From the **Console Tree**, expand **Computer Configuration** then **Administrative Templates** then **System** then **Device Installation** and then select **Device Installation Restrictions**.

The list of device installation restrictions displays.

5. Edit policy settings so that no device installation restrictions are configured.

Alternatively, review each policy setting to determine the correct configuration for your business needs.

6. Exit the **Local Group Policy Editor**.
7. Restart the Microsoft Windows virtual machine.

When you are finished configuring the policy settings for device installation, you can proceed with the installation of the Oracle VM Paravirtual Drivers for Microsoft Windows.

### 3.2 Installing Oracle VM Paravirtual Drivers for Microsoft Windows

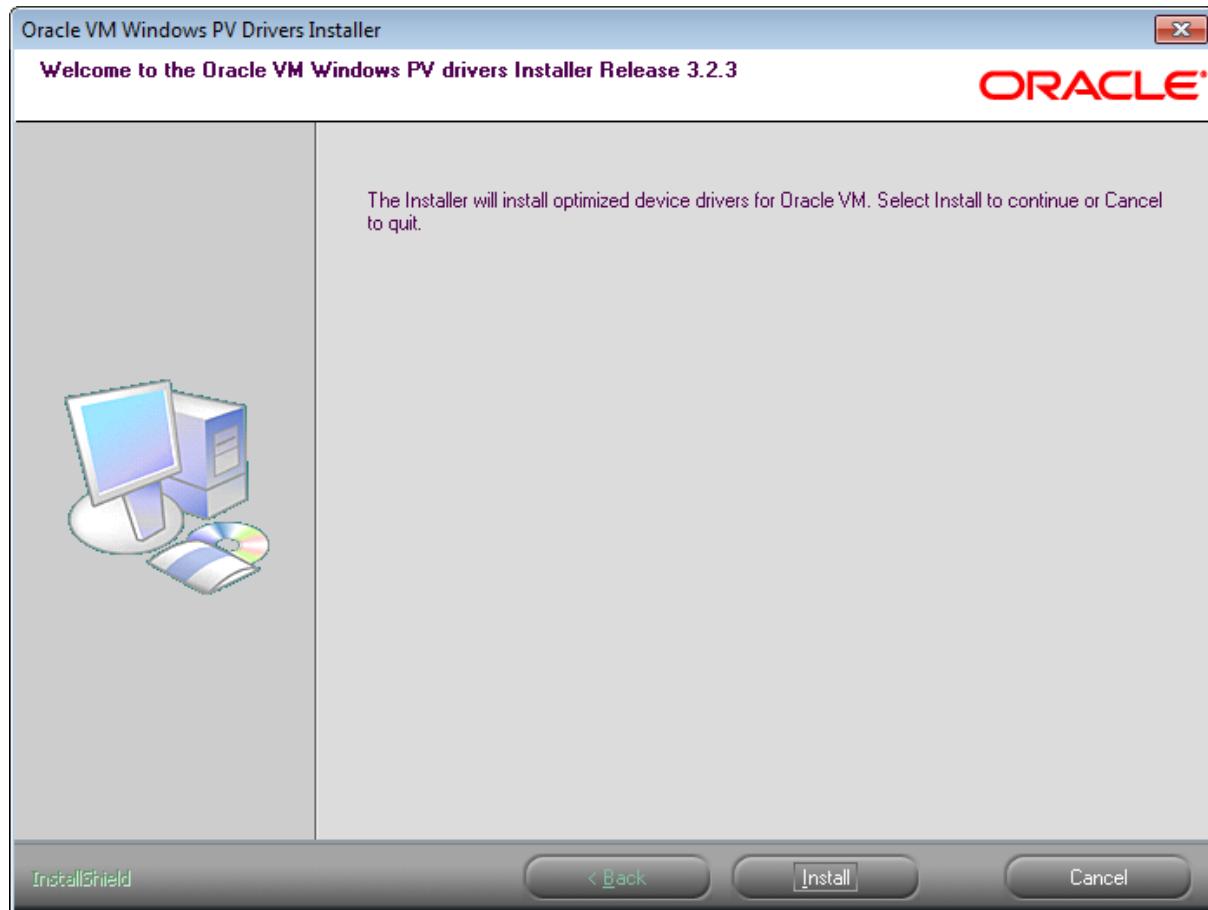
**Before You Begin.** Do the following before you start the installation process:

- Review the list of supported Microsoft Windows operating systems. See [Section 1.3, “Supported Guest Operating Systems”](#).
- Configure system policies to allow the installation. See [Section 3.1, “Configuring Policies for Device Installation”](#).

**To install the Oracle VM Paravirtual Drivers for Microsoft Windows:**

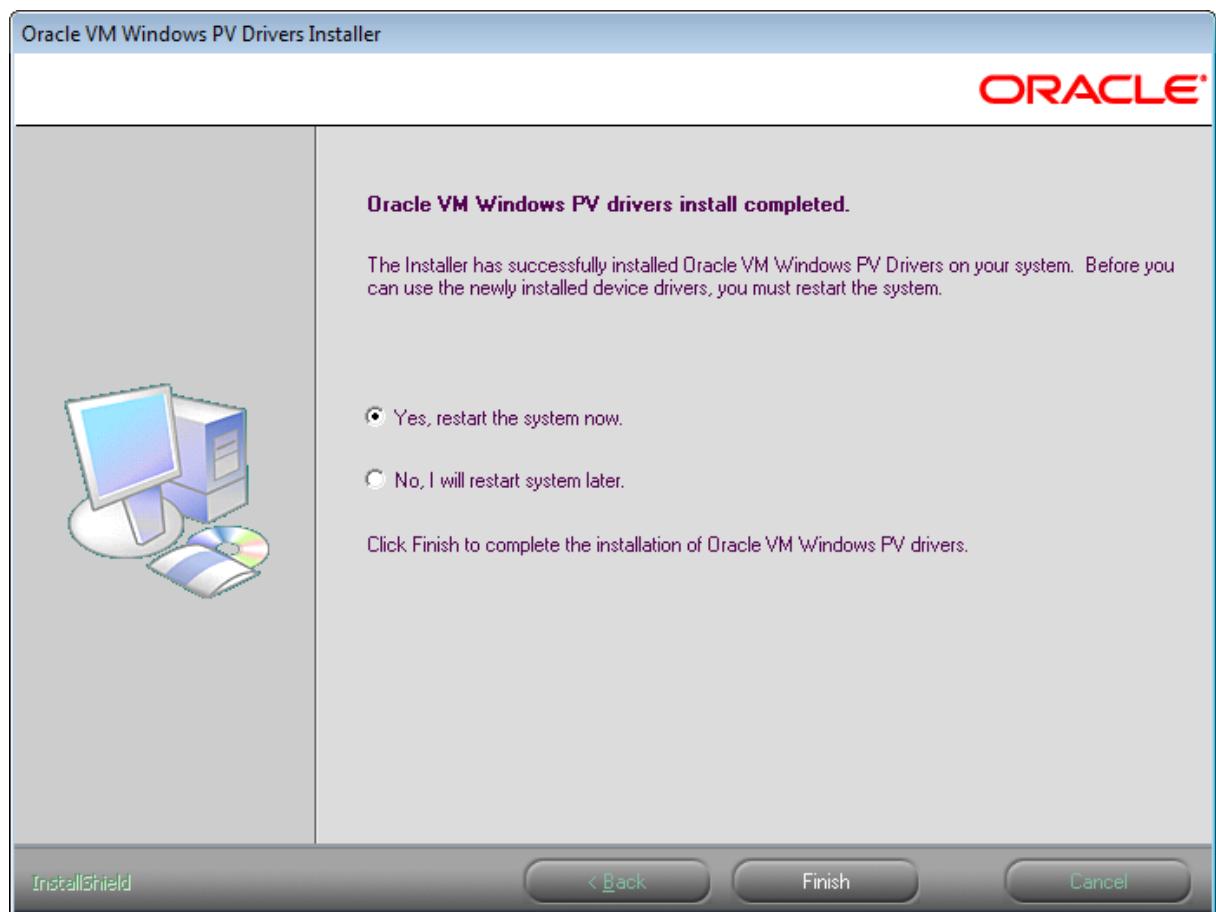
1. Create a new virtual machine and install a supported operating system.
2. Copy the Oracle VM Paravirtual Drivers for Microsoft Windows ([Setup.exe](#)) to the guest.
3. Double click the [Setup.exe](#) file to start the Oracle VM Paravirtual Drivers for Microsoft Windows installer. The initial installer window is displayed.

**Figure 3.1 Oracle VM Paravirtual Drivers for Microsoft Windows installer window**



4. Click **Install** to start the Oracle VM Paravirtual Drivers for Microsoft Windows installation.
5. The installer copies the Oracle VM Paravirtual Drivers for Microsoft Windows files, and installs the drivers on the guest. The **Installation Complete** window is displayed.

Figure 3.2 Installation Complete window



Check **Yes, restart the system now** and click **Finish**. The virtual machine is restarted.

### 3.3 Performing a Silent Install

You can create a response file that contains all installation options. Once you have the response file, you can install the Oracle VM Paravirtual Drivers for Microsoft Windows silently.

**Before You Begin.** Do the following before you start the installation process:

- Review the list of supported Microsoft Windows operating systems. See [Section 1.3, “Supported Guest Operating Systems”](#).
- Configure system policies to allow the installation. See [Section 3.1, “Configuring Policies for Device Installation”](#).

To create the response file for silent installations, do the following:

1. Run the installer with the `/r` option. Proceed through the dialogs and complete the installation. This will create a `setup.iss` file and place it in the `C:\windows` directory. This file includes all of your responses to the InstallShield dialogs, allowing you to perform unattended installations.
2. Copy `setup.iss` to the same directory as the Oracle VM Paravirtual Drivers for Microsoft Windows installer executable and run the installer with the `/s` option.

## 3.4 Verifying the Oracle VM Paravirtual Drivers for Microsoft Windows Installation

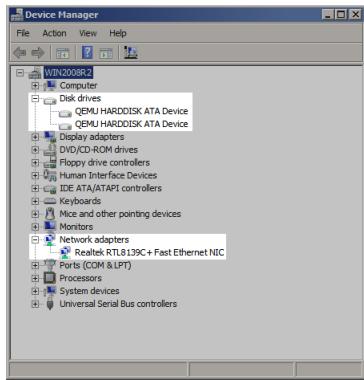
To verify the Oracle VM Paravirtual Drivers for Microsoft Windows installed successfully, do the following:

1. Open the Microsoft Windows virtual machine on which you installed the Oracle VM Paravirtual Drivers for Microsoft Windows.
2. From the **Control Panel**, locate and open the **Device Manager** window.
3. Expand **Disk drives** and verify that the following entry exists: [Oracle VM Virtual SCSI Disk Device](#).
4. Expand **Network adapters** and verify that the following entry exists: [Oracle VM Virtual Ethernet Adapter](#).

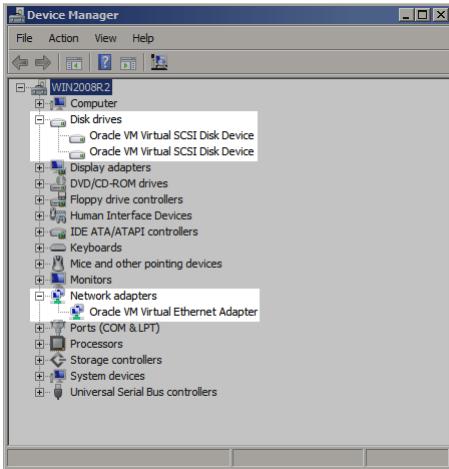
If both device entries exist, and do not have any device issue symbols next to them, then the Oracle VM Paravirtual Drivers for Microsoft Windows are installed successfully.

If a device issue symbol, such as a black exclamation mark on a yellow field, displays next to either device, you should attempt to reinstall the Oracle VM Paravirtual Drivers for Microsoft Windows. If the device issue symbol displays next to the device after you reinstall, either refer to the appropriate Microsoft Windows documentation for troubleshooting procedures or contact Oracle support.

The following image is an example of device drivers before installing the Oracle VM Paravirtual Drivers for Microsoft Windows:



The following image is an example of device drivers after successfully installing the Oracle VM Paravirtual Drivers for Microsoft Windows:



### 3.5 Setting the MTU Size for Virtual Machines

The Oracle VM Paravirtual Drivers for Microsoft Windows override the maximum transmission unit (MTU) settings in the virtual network adapters for Microsoft Windows virtual machines. After you successfully install and verify the Oracle VM Paravirtual Drivers for Microsoft Windows, you should set the MTU for each guest virtual machine.

To set the MTU size for a virtual machine, do the following:

1. Open the Microsoft Windows virtual machine.
2. From the **Control Panel**, locate and open the **Device Manager** window.
3. Expand **Network adapters** and select the appropriate [Oracle VM Virtual Ethernet Adapter](#).
4. Right-click the adapter, select **Properties**, and then select the **Advanced** tab.
5. Select the **MTU** property and set the value as appropriate. Click **OK** to save your changes.



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# Chapter 4 Known Limitations and Workarounds

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This section contains information on known limitations and workarounds for the Oracle VM Paravirtual Drivers for Microsoft Windows.

### 4.1 Security Alert for Unsigned Drivers

The Oracle VM Paravirtual Drivers for Microsoft Windows are not signed for 32-bit Microsoft Windows operating systems or Microsoft Windows Server 2003. As a result, the following security alert displays during installation:



To continue the installation, click **Yes** and then click **Continue Anyway** when the following screen displays:



Bug 18361346

### 4.2 Upgrading on Microsoft Windows 32-bit

Upgrading from Oracle VM Paravirtual Drivers for Microsoft Windows Release 3.2.2 to Release 3.2.3, and then uninstalling Release 3.2.3, might cause a fatal system error. This issue might occur on some

Microsoft Windows 32-bit versions, such as Microsoft Windows 2008 SP2, Microsoft Windows 7, and Microsoft Windows 8.1.

**Workarounds:**

- Uninstall Oracle VM Paravirtual Drivers for Microsoft Windows Release 3.2.2 before you install Release 3.2.3.
- If you encounter this issue, restart the system and then use the Oracle VM Paravirtual Drivers for Microsoft Windows Release 3.2.3 installation program to completely uninstall Release 3.2.3. You should then uninstall Oracle VM Paravirtual Drivers for Microsoft Windows Release 3.2.2 before installing Release 3.2.3.

## 4.3 Windows Guest Kernel Panic

Windows guests may experience kernel panic when the virtual machine is stopped and started several times. This may also occur if there is intensive I/O. The error in this case is:

`(XEN) p2m_pod_demand_populate: Out of populate-on-demand memory!`

**Workaround:** Set the **Maximum Memory** and the **Memory** fields to the same value in the **Create/Edit Virtual Machine** wizard in [Oracle VM Manager](#).

[Bug 10334923](#)

## 4.4 Found New Hardware Wizard Displayed

During the installation or uninstallation of the Oracle VM Paravirtual Drivers for Microsoft Windows, the **Found New Hardware** wizard is displayed during the installation/uninstallation, and when the guest restarts. This only occurs on a guest with Microsoft Windows Server 2003 (32- or 64-bit) installed.

**Workaround:** Click **Cancel** to ignore the message and close the dialog box.

## 4.5 Crash Dump or Hibernation Fails

The stop error `0x000000D1` may occur when doing a crash dump or hibernation. This only occurs when using the Oracle VM Paravirtual Drivers for Microsoft Windows Release 3.0.1 on Microsoft Windows Server 2008 R2, Microsoft Windows Server 2008, and Microsoft Windows Vista or Microsoft Windows 7.

**Workaround:** Download and install the Microsoft hotfix:

<http://support.microsoft.com/kb/2320550/>

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# Glossary

## D

### dom0

An abbreviation for *domain zero*. The management domain with privileged access to the hardware and device drivers. Dom0 is the first domain started at boot time. Dom0 has more privileges than domU. It can access the hardware directly and can manage the device drivers for other domains. It can also start new domains.

### domU

An unprivileged domain with no direct access to the hardware or device drivers. Each domU is started by dom0.

## G

### guest

A guest operating system that runs within a domain in Oracle VM Server. A guest may be paravirtualized or hardware virtualized. Multiple guests can run on the same Oracle VM Server.

## O

### Oracle VM Manager

The Oracle VM Manager is the management platform, which offers an easy-to-use, web-browser interface as well as a command-line interface (CLI). The Oracle VM Manager tracks and manages the resources available in your virtual environment. The user interface, which is an Application Development Framework (ADF) web application, allow you to easily manage Oracle VM Server pools. Manages virtual machine life cycle, including creating virtual machines from templates or from installation media, deleting, powering off, uploading, deployment and live migration of virtual machines. Manages resources including ISO files, templates and shared virtual disks.

## P

### paravirtualized machine (PVM)

A virtual machine with a kernel that is recompiled to be made aware of the virtual environment. Runs at near native speed, with memory, disk and network access optimized for maximum performance.

Paravirtualized guests use generic, idealized device drivers, which are part of the guest's OS. The I/O operations using these generic device drivers are mapped to the real device drivers in dom0. The generic, abstracted drivers in the guest seldom change and provide excellent guest stability. The dom0 domain, alternatively, can use the native hardware vendor drivers, and the guests can safely migrate to another dom0 with slightly different drivers.

For other resources such as CPU and memory, paravirtualized kernels make special "hypercalls" to the Xen hypervisor. These hypercalls provide better performance by reducing the number of instructions and context switches required to handle an incoming request. By contrast, on an emulated (hardware virtualized) guest, driver requests engage the guest's interrupt handler, increasing the I/O operation overhead.

